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(71) Applicants  
Unilever Limited,  
Unilever House,  
Blackfriars,  
London EC4,  
England.  
(72) Inventors  
Donald Frank Darling  
Eric Dicks  
(74) Agent  
Dr. D. Litherland

(54) Artificial creams

(57) Artificial creams essentially free from milk proteins are particularly suitable as coffee creams and comprise an emulsion of edible fat, especially containing up to about 30% lauric fat, with an emulsifier system comprising a mixture of lecithin with selected nonionic and an ionic emulsifier preferably having a predetermined range of HLB activity. Gums, sugar, colour and flavouring may also be present.

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## SPECIFICATION

## Improvements in and relating to food

- 5 This invention relates to artificial creams, in particular to creams which are suitable for use as a coffee whitener, and to emulsifiers for use therein.
- Artificial creams intended to replace dairy cream for such culinary purposes as cake and confectionery filling and decoration as well as for whitening coffee, commonly include a protein source, in particular milk protein. Such creams may be prepared from milk powder using less water than is usually required to reconstitute the milk. They usually also contain various combinations of gums and stabilisers, both natural gums and chemical derivatives of natural materials such as cellulose or starch. Methylcellulose can be used to replace the protein normally present in creams and still retain good whipping and emulsion stability characteristics by the judicious inclusion where necessary of additional stabilising components and emulsifiers. Hitherto, certain important characteristics were nevertheless lost, including in particular stability at elevated temperatures in hot liquids, apparently due to a decrease in solubility with increase in temperature of methylcellulose.
- The present invention is based upon a study of the essential properties which protein confers on creams, including in particular their stability in hot coffee, and its replacement by a suitable combination of ingredients having related properties.
- 20 The invention therefore provides, in or for artificial creams based on aqueous edible fat dispersions, a replacement composition for the protein usually present in such creams, comprising a mixture of lecithin with an ionic, lipophilic emulsifier, preferably a soluble salt of a long chain alkoxylated hydroxypolycarboxylic food acid and another, nonionic hydrophilic emulsifier comprising a polyoxyalkylene condensate. The long chain contains at least 10 carbon atoms.
- 25 The lipophilic emulsifier is more soluble in the fat phase of the cream whereas the hydrophilic emulsifier is more soluble in the aqueous phase. All the emulsifiers must of course be of acceptable food grade. The amount of emulsifiers together in the cream product should be less than 1%, based by weight as are all the percentages and proportions in this specification, on the total composition including water. More particularly a total concentration not exceeding 0.5% but at least 0.01% of the emulsifier mixture is present in the cream compositions of the invention.
- Substantially more lecithin must be present for best results than is normally found in natural cream, between 0.02 and 0.1% for preference, more particularly approximately 0.05%. The lecithin nevertheless preferably is present in the least amount of the three emulsifiers, from 1 to 5 to 1 to 10, preferably approximately 1 to 6, with preferably approximately equal amounts of the other two emulsifiers. The lecithin may be derived from soyabean or egg sources and hydrolysed lecithin emulsifiers may be used.
- 35 Preferably the polyoxyalkylene condensate is based on a sorbitan ester such as monolaurate or monostearate. The alkylene groups of the condensate are preferably short chain not exceeding three carbon atoms in a condensate unit of a group from 10 to 13 units.
- Preferably the salt is a sodium salt, particularly a lactylated stearate, palmitate, laurate or other long chain saturated fatty acid alkoxy group.
- 40 Preferably the calculated Hydrophilic-Lipophilic Balance (HLB) of the mixture of emulsifiers is within the range 8-12 on the scale in which a charged species is included, based on Honeywell-Atlas method of HLB determination. This ensures a stable emulsion in both liquid and whipped form. A suitable mixture meeting this requirement is for example polyoxyethylene (20) sorbitan monostearate/sodium stearyl lactylate/soya lecithin in the weight range 3:3:1 in a concentration from 0.3 to 0.5 wt %, and an apparent HLB value on the above scale of 8-9, but other ratios and concentrations may be used.
- Where a whipping cream is specifically required an end-point enhancer and whipped product stabiliser is preferably included, e.g. glyceryl monostearate, at a concentration of from 0.05-0.1 wt % in the product and cations, preferably in the form of sodium, e.g. sodium bicarbonate at approximately 0.05% concentration, that will contribute to improved whipped cream consistency may also be included.
- 50 The fat component of the cream compositions of the invention is preferably a vegetable fat, which may be modified by blending, fractionation, hydrogenation or interesterification in accordance with the current practices of the art. Preferably it is a lauric fat although others, particularly palm oil and its derivatives may be suitable. Palm kernel oil is particularly preferred when hydrogenated to a substantially saturated condition, i.e. an iodine value 3 or less. In any event preferably the fat has a slip melting point of 37-38°C and approximate solids content values of  $N_{20}$  80%,  $N_{30}$  22%.
- The compositions of the invention preferably contain at most 30 wt % of fat especially 15 to 25 wt % fat, compared with not less than 35 wt % milk fat in whipping cream. These lower amounts are used preferably in the presence in the compositions also of a structural agent dispersed in the aqueous phase, usually a gum and preferably xanthan gum, although other structuring agents, e.g. sodium carboxymethylcellulose, sodium alginate or carrageenan gum may also be present, at least 0.1% being preferred, up to 0.3% maximum.
- 60 Buffer salts, particularly trisodium citrate and sodium tripolyphosphate aid the performance of the products of the invention as coffee whiteners and inhibit the coagulating effect on any alginate present in the infusion of calcium salts in the coffee infusion.

The cream products of the invention may be used as coffee whiteners, pouring creams or as a topping or whipped to a light cream and for other culinary purposes. They provide a cheaper alternative to the natural products and can exhibit superior uniformity of whip. They may be subjected to high temperature sterilisation to enhance the shelf-life of the products.

- 5 Preferably the ingredients of the cream products of the invention are assembled in separate fat and aqueous phases which are then put together. The lecithin, alkoxylated polycarboxylic salt and other emulsifiers are dispersed in the melted fat, but the nonionic polyoxyalkylene condensate is dispersed in cold water with suitable agitation, followed by the remaining ingredients, preferably starting with salts followed by alginate, gums and any sodium carboxymethylcellulose required. 5
- 10 The aqueous phase is then heated slightly above the melting point of the fat and the two phases mixed together. The mixture is then heated to a pasteurisation temperature, cooled somewhat and homogenised before being finally cooled for packaging purposes. Pasteurisation may be effected by direct heating with steam for limited periods. 10

#### EXAMPLE

- 15 The following ingredients were assembled as above described, in separate phases comprising cold town water and fat at 50°C:- 15

Ingredient		%	
20	Manucol MHA (sodium alginate)	0.15	Aqueous phase
	Sugar (sucrose)	1.5	
	Trisodium citrate	0.1	
	Sodium tripolyphosphate	0.25	
	Xanthan gum	0.15	
25	Tween 60	0.15	Oil phase
	Water	72.19	
	Hydrogenated palm kernel oil	25.2	
	Sodium stearoyl lactylate	0.15	
30	Lecithin	0.045	
	Glyceryl monostearate	0.075	
	Permitted colour and flavour	0.04	

- 35 The mixture of two phases was heated to 77°C and maintained at this temperature for pasteurisation purposes for ten minutes before being cooled to 50°C and homogenised at 200-250 kgms/cm<sup>2</sup>. The product was finally cooled to 5-10°C and was suitable as a coffee whitener or for pouring cream and could be whipped to an overrun of 100-250%, stable for 2 hours, using standard mechanical whipping machines. The product exhibited a pleasant mouth-feel and light texture. 35

#### 40 CLAIMS 40

1. Artificial cream composition comprising an aqueous dispersion substantially free from milk protein of edible fat and containing a mixture of lecithin with an ionic lipophilic emulsifier and a nonionic hydrophilic emulsifier comprising a polyoxyalkylene condensate. 45
2. Composition according to Claim 1 wherein said mixture is present in a total concentration not exceeding 0.5%, but at least 0.01%.
3. Composition according to Claim 1 or 2 which contains from 0.02 to 0.1% lecithin.
4. Composition according to any of the preceding claims wherein the amount of lecithin present comprises from 10 to 20% of the said mixture. 50
5. Composition according to any of the preceding claims wherein the lipophilic and hydrophilic emulsifiers are present in approximately equal amounts.
6. Composition according to any of the preceding claims wherein said condensate comprises from 10 to 13 alkylene groups, each not exceeding 3 carbon atoms.
7. Composition according to Claim 6 wherein the said condensate is based on a sorbitan ester. 55
8. Composition according to any of the preceding claims wherein the said condensate is a mono-laurate or -stearate sorbitan ester.
9. Composition according to any of the preceding claims wherein said salt comprises a lactylated laurate, palmitate or stearate.
10. Composition according to any of the preceding claims wherein the HLB balance of said mixture as hereinbefore defined is from 8 to 12. 60
11. Composition according to claim 10 wherein said mixture comprises polyoxyethylene (20) sorbitan monostearate, sodium stearoyl lactylate and soya lecithin in the approximate proportions of 3:3:1 and an HLB value 8 to 9.
12. Composition according to any of the preceding claims which contains less than 30% fat. 65

13. Composition according to any of the preceding claims wherein the said fat comprises a lauric fat.
14. Composition substantially as hereinbefore described with reference to the accompanying Example.
15. Emulsifier composition suitable for use in any of the compositions claimed and comprising a mixture of lecithin with a soluble salt with a long chain alkoxylated hydroxypolycarboxylic food acid and a hydrophilic nonionic emulsifier comprising a polyoxyalkylene condensate. 5
16. Method of preparing an artificial cream composition as claimed in Claim 1 comprising preparing a dispersion of the lecithin and the salt in the melted fat and of the polyoxyalkylene condensate in the aqueous phase with gums and thickening agents as required, homogenising and heat-pasteurising the two phases together.
- 10 17. An emulsifier mixture suitable for use in artificial cream compositions as claimed in Claim 1 and comprising a mixture of lecithin with an ionic lipophilic emulsifier and a nonionic hydrophilic emulsifier comprising a polyoxyalkylene condensate. 10

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